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THE RURAL HOME

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The Site

In selecting a site for a rural home, valleys and hollows should be avoided. It is desirable to locate the dwelling at least on the average elevation of the surrounding neighborhood. Be careful to keep away from the night condensation from the hillsides. The soil should be naturally well drained. Mosquito-breeding localities should be avoided in all climates. The dwelling should not be shaded by trees unless in tropical or sub-tropical regions, and even in such places only from the midday and early afternoon sun. In cold latitudes, forests to the north and northwest, far enough away not to throw shadows on the building earlier than two hours before sundown, are a protection against the severe winter winds.

Dust is detrimental to health ; therefore, it is wise in selecting a residence in a rural district to keep well back from a public road. Before concluding upon a site, one should survey the neighborhood for public nuisances where offensive gases, smoke or dust may be carried by the winds to the home.

The house should preferably be long and narrow so that the broad sides may face the sun, and in this latitude receive the full sweep of the southern winds.

A square house is economical in shape and this should face or back to the southeast.

It is not desirable to have porches built long and narrow hugging the walls of the house, thereby cutting out the sun's rays from the first floor and cellar. A porch should be constructed either in the form of a square or parallelogram.

The long way of the parallelogram should be placed at right angles to the house. Either of these will give a porch throwing a minimum of shadow on the house and at the same time will, by its width, permit retirement from the hot sun in the summer and the

rains, whereas the occupants of a long, narrow porch are often driven into the house by the sun or a light fall of rain.

Second story porches for sleeping purposes are conducive to health. No room can be designed that permits of the same natural movement of fresh air as an open veranda.

Geological Formation

The topographical considerations being settled for the site, we consider next the geological formation of the surface and sub-soil. A glacial or broken rock formation, extending a foot or so below the foundations of the cellar walls gives a perfect drainage. A solid serpentine rock formation is very expensive to blast out, but makes a dry cellar. If you have to build in a clay formation, good glacial gravel or unglazed terra cotta pipes should be used for building drains, so that any water which settles down along the cellar walls can be readily carried off. Some of the shales make a fairly dry ground to build in. A broken hard sandstone is not an objectionable formation.

Transportation Facilities

Ready transportation to a business center is of great importance. Badly ventilated coaches on railroads, and the same objection obtains on many trolley lines, plus the deadly overcrowding, particularly when the industrious wage-earners are hurrying to their homes, are a constant menace to health.

Water Supply

This is one of the most important of all requisites, yet often overlooked until the grounds have been purchased; yes, often the house is built before the purity of the water supply has been determined.

Water found in limestone formations is often polluted. The fissures in limestone will carry water and sewage almost as well as iron pipes. So well is the fact appreciated by oldtime dwellers on such formations that they bore down until they find a limestone fissure and then drain their sewage into the same. In such formations you find some of the gushing springs spouting out great volumes of good looking but infected water. They have been prized for power and for domestic purposes, but the science of to-day often demonstrates their absolute unfitness for the latter.

Open streams vary much in the degree of their purity. This depends upon the character of the watersheds. The banks are often occupied by dwellings which drain their sewage directly or indirectly into them. They often run along or under railroads where they catch the sewage from the passing trains. They often run near and along public roads from the gutters of which they collect the sewage from the traveler.

Surface water, to be safe, should be filtered unless it is carried in pipes from a non-inhabited and untraveled watershed.

Surface springs depend upon the formation through which they travel as well as on the watershed which collects them. The water travels under the surface until the formation of the earth's surface permits it to again flow out at the spot called the spring.

Deep wells, tubed down into the sandstone, and carefully cased off generally produce a good water. The purity of water must be determined from a physical examination of the watershed as well as by the chemist and bacteriologist.

If a storage tank is used for a private water supply it should be made of unpainted wood, preferably gulf cypress or cedar. Black iron covered with asphaltum makes a safe storage tank. Lead or galvanized iron should not be used. The top should be covered with a fly screen to preclude the entrance of insects, rats or mice.

The intake should enter the top at the opposite end from the outlet. The latter should enter about three inches above the bottom so as not to disturb the sediment in the bottom of the reservoir.

Sewerage and Drainage

Equally important with the securing of a good, wholesome abundant water supply is the provision for its disposal after use. To flood a house with water without making ample arrangement for its ultimate disposition is to commit an absurd blunder which must lead to much subsequent annoyance and trouble. In fact, the sewerage should have the first consideration. The reverse plan is like "putting the cart before the horse."

The sewage, including the bath water and kitchen waste, must not be discharged into surface or underground streams. It can be passed into cement cesspools where the use of water is not too excessive; otherwise the cost of cleaning out would be prohibitory.

The cesspool can be often cleansed by pumping off the effluent, disinfecting it and using it for fertilizing where sufficient ground can be had. Gravel, broken stone, and disintegrated iron formations can be used for percolating cesspools when far removed from streams or shallow wells used for drinking purposes. Filter plants consisting of biological tanks, sprinkling beds and sand filtration and disinfecting tanks can be used so that the effluent can, with comparative safety, be permitted to pass into streams. The careless disposal of house sewage has cost the American people millions of lives, much suffering and great loss of productive mental and physical labor. The disposal of all sewage should be directed by a sanitary engineer.

Plumbing

The plumbing should be of the most sanitary kind. The soil pipes must be carried above the highest point of the roof. All fixtures should be trapped. The lavatories and bathtubs must be plugged at the bottom of the fixtures and not back in the waste pipe as that would leave a part of the dirty pipe to fill with water and then back up into the lavatory or bathtub water that would be drawn to wash in. A chain attached to the plug is a very insanitary arrangement and should be forbidden by law. An old-fashioned stand pipe or plug worked so that it is forced up or down from an arrangement outside the tub are both highly sanitary.

Ventilation

No room, including bath and toilet rooms, should be built without a window opening to the outside of the building. Every room should have at least two windows of good size extending from a foot below the ceiling to at least two feet above the floor, preferably in walls at right angles to each other.

Bedrooms should have transoms over the doors opening into the halls so as to permit of cross-ventilation. With the doors of the first floor rooms generally open and the transoms just referred to from the bedrooms opening into the second and third story halls, we secure an important ventilating factor if the well of the stairway is heated and carried to a vent at the roof.

Transoms over the doors on the first floor opening to the outside make excellent inlets for fresh air. They should be hinged at the bottom so that the incoming air first strikes the ceiling instead of being directed immediately to the floor.

Heating

Every dwelling should have a dry, well-lighted cellar with a headway giving sufficient fall to ensure a ready return of water to the boiler of a steam or hot-water heating system in case one or the other should be used. The heating system may be a hot-air furnace fired by coal, gas, sprayed oil or wood, depending upon the locality. The heating surfaces in any system should be supplied by fresh, outdoor air robbed of its natural wind movement as much as possible by a receiving chamber or chambers so that the air, when warmed, may be forced along by the falling of the cold outdoor air upon it and driving it up the hot air flues to the dwelling parts of the building. This is called indirect heating. Direct heating in living rooms, offices or public buildings is the cause of much ill-health and the loss of many useful lives. *Direct* heating is a system in which a steam or hot-water radiator is placed in a room or hall, thus simply heating the same air in the building over and over again after it has been chilled, principally by the cold glass in the windows. Such air is soon robbed of its oxygen by those occupying the room and becomes filled with organic matter from the exhalations from the human body. Living in such an atmosphere the blood soon becomes poor and the different organs of the body are starved and fail to do their work, and then the body falls a victim to all sorts of diseases. Three thousand cubic feet should be supplied for each person every hour. To maintain perfect health we must live in a moving body of fresh air both night and day, let it be warm or cold.

The hot-air flues should be built of terra cotta. It is economical to have a continuous tin flue inside the terra cotta so as to conserve all the heat. While the outside walls are colder, the heating register is always better placed on the outside walls or near them in one of the cross-section walls, as the movement is generally from the outside wall and, therefore, you get a more uniform distribution of warm air through the room. Forced ventilation is too expensive for the large majority of rural homes.

If a hot-air furnace is used, water should be kept in the hot-air chamber constantly, and the furnace kept in perfect order to prevent poisonous gases from leaking into the former to be thus distributed throughout the house.

When stoves, furnace or boiler fires are banked at night, the

fire door should not be used to check the draft. If, however, it is so used, a candle or lighted match should be held at the top of the door as it is being opened to gauge how wide to open it. It should never be opened wider than to the point where the flame is drawn into the fire-box, otherwise the gases will escape into the room. This same process should be adopted with the lid of the range fire in the kitchen. The air of houses is often charged with poisonous gases from the kitchen fire on account of the coal being built up above the top of range or the lid having been so far removed that the gases escape into the room instead of being drawn into the fire and passing up the smoke flue.

Open fires are good as auxiliaries with other methods of heating. They will overcome the dangers of the pernicious direct radiator system if sufficiently large to demand 500 cubic feet of fresh air per person every hour.

The Cellar

The cellar floor should be of cement or asphaltum. The construction should be such that rats cannot find their way into the walls. All vermin are dangerous to health. The inside walls would be better finished of some material that can be washed or easily cleansed.

The cellar should have an eight-foot ceiling, the first and second floors at least ten feet, the third from eight to nine feet.

Materials

The roof should be fire and waterproof. Hardburned brick, lined, giving an air space, makes a good wall. A cheaper structure would be of wooden or asbestos shingles. A soft stone makes a dryer house than the hard rock. All stone walls should be lined with hollow terra cotta. A dampproof course should be introduced in outside walls just below the first floor joist. All houses should be elevated sufficiently to permit of light, air and sunshine in the cellars.

Lighting

The lighting is important. Water gas is highly poisonous and, therefore, when used, the fixtures should be kept in perfect order with the stops so constructed that there is a good shoulder for the key to turn hard against, so that it cannot be turned too far around

and thus leave the gas partly on when the handler believes he has turned it completely off. Fixtures for any system of lighting should be placed beyond the reach of children.

Coal gas is much less dangerous, yet should be carefully guarded against. Acetylene gas is less dangerous. When mixed with too much of the atmosphere, it will explode. This should not occur owing to its early detection, as it is very pungent when breathed and, therefore, its presence easily detected. It should never be manufactured in the home.

Electric light is dangerous unless the wires are well insulated and passed through tubes along their entire course.

The best light for the eyes is from lamps placed in a bowl with a reflecting lining, hanging from the ceiling. This will throw a diffused light over the room when the reflected rays strike a light-colored ceiling.

Stables

All stables should be kept cleared of manure, this being placed in pits and screened so that flies cannot enter to lay their millions of eggs. To guard against insects and vermin carrying filth into your house and on to your food, the dwelling should be screened. The kitchen and dining-rooms should certainly be screened, if one cannot afford to protect the entire house.

It may be added as a corollary to the above advice that the rural dweller should be not less critical as to the sanitary conditions of his business home in which he spends nearly half his life, than he is as to those of his home in the country.